

sub B1
~~wherein, when the nutritional substance is a food preparation, the food preparation comprises two or more food components and each gram of said food preparation has a natural molar amount, N, of said one or more natural isomers of reduced folate, wherein N is greater or equal to zero and wherein each gram of said composition has a total molar amount, T, of said one or more natural isomers of reduced folate greater than N; and~~

~~wherein, when the nutritional substance is an essential nutrient preparation, the essential nutrient preparation comprises a vitamin other than ascorbic acid.~~

~~46. A composition for human consumption comprising:
one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof; and~~

~~a nutritional substance for human consumption being a food preparation;~~

~~wherein the food preparation comprises two or more food components and each gram of said food preparation has a natural molar amount, N, of said one or more natural isomers of reduced folate, wherein N is greater or equal to zero and wherein each gram of said composition has a total molar amount, T, of said one or more natural isomers of reduced folate greater than N; and~~

~~wherein each gram of said composition further comprises no unnatural isomers of reduced folate selected from the group consisting of (6R)-tetrahydrofolic acid, 5-methyl-(6R)-tetrahydrofolic acid, 5-formyl-(6R)-tetrahydrofolic acid, 10-formyl-(6S)-tetrahydrofolic acid, 5,10-methylene-(6S)-tetrahydrofolic acid, 5,10-methenyl-(6S)-tetrahydrofolic acid, 5-formimino-(6R)-tetrahydrofolic acid, and polyglutamyl~~

derivatives thereof, or, if present, one or more of said unnatural isomers of reduced folate in a molar amount less than T minus N.

47. A composition according to claim 46, wherein the food preparation is selected from the group consisting of breakfast foods, infant formulas, dietary supplements, complete diet formulas, and weight-loss preparations.

48. A composition according to claim 47, wherein the breakfast food is a prepared cereal, a breakfast drink mix, or a toaster pastry, and wherein the weight-loss preparations is a weight-loss drink or a weight-loss bar.

49. A composition for human consumption comprising:
one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof; and

a nutritional substance for human consumption being an essential nutrient preparation, the essential nutrient preparation comprising a vitamin other than ascorbic acid, wherein the vitamin is present in an amount equal to or greater than 25% of the daily requirement for the vitamin per customarily consumed quantity of said essential nutrient preparation.

50. A composition for human consumption comprising:
one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof; and

Sub B2

Sub B2 ~~a nutritional substance for human consumption selected from the group consisting of a food preparation, an essential nutrient preparation, and combinations thereof;~~

A1 ~~wherein the total amount of said one or more natural isomers of reduced folate in said composition is less than or equal to about 4.5 micromoles per customarily consumed quantity of said composition;~~

~~wherein, when the nutritional substance is a food preparation, the food preparation comprises two or more food components and each gram of said food preparation has a natural molar amount, N, of said one or more natural isomers of reduced folate, wherein N is greater or equal to zero and wherein each gram of said composition has a total molar amount, T, of said one or more natural isomers of reduced folate greater than N; and~~

~~wherein, when the nutritional substance is an essential nutrient preparation, the essential nutrient preparation comprises a vitamin other than ascorbic acid.~~

Sub C1 ~~51. A composition according to claim 45, 49 or 50, wherein the essential nutrient preparation further comprises ascorbic acid.~~

Sub C2 ~~52. A composition according to claim 45, 46, 49 or 50, wherein the one or more natural isomers of reduced folate is selected from the group consisting of 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, and polyglutamyl derivatives thereof.~~

Sub C3 ~~53. A composition according to claim 45, 46, 49 or 50, wherein each of the one or more natural isomers of reduced folate is substantially chirally pure.~~

Sub B3 ~~54. A method for increasing the folate content of a nutritional substance for human consumption comprising: providing a nutritional substance for human consumption selected from the group consisting of a food preparation, an essential nutrient preparation, and combinations thereof; and~~

Sub B3
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~~incorporating into the nutritional substance an amount of one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof, thereby forming a composition;~~

~~wherein the total amount of said one or more natural isomers of reduced folate incorporated into said nutritional substance is between about 5% and about 200% of a human daily requirement for folate per customarily consumed quantity of said nutritional substance;~~

~~wherein, when the nutritional substance is a food preparation, the food preparation comprises two or more food components and each gram of said food preparation has a natural molar amount, N, of said one or more natural isomers of reduced folate, wherein N is greater or equal to zero and wherein each gram of said composition has a total molar amount, T, of said one or more natural isomers of reduced folate greater than N; and~~

~~wherein, when the nutritional substance is an essential nutrient preparation, the essential nutrient preparation comprises a vitamin other than ascorbic acid.~~

~~55. A method for increasing the folate content of a nutritional substance for human consumption comprising:~~

~~providing a nutritional substance for human consumption being a food preparation; and~~

~~incorporating into the nutritional substance an amount of one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid,~~

5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof, thereby forming a composition;

wherein the food preparation comprises two or more food components and each gram of said food preparation has a natural molar amount, N, of said one or more natural isomers of reduced folate, wherein N is greater or equal to zero and wherein each gram of said composition has a total molar amount, T, of said one or more natural isomers of reduced folate greater than N, and wherein each gram of said composition further comprises no unnatural isomers of reduced folate selected from the group consisting of (6R)-tetrahydrofolic acid, 5-methyl-(6R)-tetrahydrofolic acid, 5-formyl-(6R)-tetrahydrofolic acid, 10-formyl-(6S)-tetrahydrofolic acid, 5,10-methylene-(6S)-tetrahydrofolic acid, 5,10-methenyl-(6S)-tetrahydrofolic acid, 5-formimino-(6R)-tetrahydrofolic acid, and polyglutamyl derivatives thereof, or, if present, one or more of said unnatural isomers of reduced folate in a molar amount less than T minus N.

56. A method for increasing the folate content of a nutritional substance for human consumption comprising:

providing a nutritional substance for human consumption being an essential nutrient preparation, the essential nutrient preparation comprising a vitamin other than ascorbic acid, wherein the vitamin is present in an amount equal to or greater than 25% of the daily requirement for the vitamin per customarily consumed quantity of said essential nutrient preparation; and

incorporating into the nutritional substance an amount of one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof.

Sub B4
57. A method for increasing the folate content of a nutritional substance for human consumption comprising:

providing a nutritional substance for human consumption selected from the group consisting of a food preparation, an essential nutrient preparation, and combinations thereof; and incorporating into the nutritional substance an amount of one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof, thereby forming a composition;

wherein the total amount of said one or more natural isomers of reduced folate in said composition is less than or equal to about 4.5 micromoles per customarily consumed quantity of said composition;

wherein, when the nutritional substance is a food preparation, the food preparation comprises two or more food components and each gram of said food preparation has a natural molar amount, N , of said one or more natural isomers of reduced folate, wherein N is greater or equal to zero and wherein each gram of said composition has a total molar amount, T , of said one or more natural isomers of reduced folate greater than N ; and

wherein, when the nutritional substance is an essential nutrient preparation, the essential nutrient preparation comprises a vitamin other than ascorbic acid.

Sub C4
58. A method according to claim 54, 56 or 57 further comprising:

incorporating into the nutritional substance an amount of one or more unnatural isomers of reduced folate selected from the group consisting of (6R)-tetrahydrofolic acid, 5-methyl-(6R)-tetrahydrofolic acid, 5-formyl-(6R)-tetrahydrofolic acid, 10-formyl-(6S)-tetrahydrofolic acid, 5,10-methylene-(6S)-

Sub C4
~~tetrahydrofolic acid, 5,10-methenyl-(6S)-tetrahydrofolic acid, 5-formimino-(6R)-tetrahydrofolic acid, and polyglutamyl derivatives thereof, wherein the amount of the one or more unnatural isomers of reduced folate is less than or equal to the amount of the one or more natural isomers of reduced folate.~~

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59. A method for increasing a human subject's dietary intake of folate comprising:

administering a composition according to claim 45, 46, 49 or 50 to the human subject.

60. A method according to claim 59, wherein said administering is carried out by enteral administration.

61. A method according to claim 59, wherein the human is selected from the group consisting of a pregnant female; a female who has had a miscarriage; a female who has carried a fetus having a neural tube defect, a cleft lip defect, or a cleft palate defect; and a human who suffers vascular disease.

62. A method for treating a human subject afflicted with intestinal malabsorption comprising:

administering to the human subject an amount of a composition effective to increase the human subject's blood folate level to a normal blood folate level, the composition comprising:

one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof; and

a nutritional substance for human consumption selected from the group consisting of a food preparation, an essential nutrient preparation, and combinations thereof;

wherein, when the nutritional substance is a food preparation, the food preparation comprises two or more food

components and each gram of said food preparation has a natural molar amount, N, of said one or more natural isomers of reduced folate, wherein N is greater or equal to zero and wherein each gram of said composition has a total molar amount, T, of said one or more natural isomers of reduced folate greater than N; and

wherein, when the nutritional substance is an essential nutrient preparation, the essential nutrient preparation comprises a vitamin other than ascorbic acid.

63. A method according to claim 54, 56, 57 or 62 wherein the essential nutrient preparation further comprises ascorbic acid.

64. A method according to claim 54, 55, 56, 57 or 62, wherein each of the one or more natural isomers of reduced folate is substantially chirally pure.

65. A method according to claim 54, 55, 56, 57 or 62, wherein the one or more natural isomers of reduced folate is selected from the group consisting of 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, and polyglutamyl derivatives thereof.

66. A method according to claim 55, 57 or 62 wherein said method further comprises:

incorporating a vitamin into the food preparation.

67. A composition for consumption by an animal, the animal selected from the group consisting of dog, cat, poultry, cattle, goat, horse, mink, fox, and sheep, the composition comprising:

one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof; and

Sub B5
a nutritional substance for consumption by the animal selected from the group consisting of a food preparation, an essential nutrient preparation, and combinations thereof;

wherein the total amount of said one or more natural isomers of reduced folate in said composition is between about 5% and about 3000% of an animal daily requirement for folate per customarily consumed quantity of said composition;

A1
wherein, when the nutritional substance is a food preparation, the food preparation comprises two or more food components and each gram of said food preparation has a natural molar amount, N, of said one or more natural isomers of reduced folate, wherein N is greater or equal to zero and wherein each gram of said composition has a total molar amount, T, of said one or more natural isomers of reduced folate greater than N; and

wherein, when the nutritional substance is an essential nutrient preparation, the essential nutrient preparation comprises a vitamin other than ascorbic acid.

68. A composition for consumption by an animal, the animal selected from the group consisting of dog, cat, poultry, cattle, goat, horse, mink, fox, and sheep, the composition comprising:

one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof; and

a nutritional substance for consumption by the animal being a food preparation;

wherein the food preparation comprises two or more food components and each gram of said food preparation has a natural molar amount, N, of said one or more natural isomers of reduced folate, wherein N is greater or equal to zero and

wherein each gram of said composition has a total molar amount, T, of said one or more natural isomers of reduced folate greater than N; and

wherein each gram of said composition further comprises no unnatural isomers of reduced folate selected from the group consisting of (6R)-tetrahydrofolic acid, 5-methyl-(6R)-tetrahydrofolic acid, 5-formyl-(6R)-tetrahydrofolic acid, 10-formyl-(6S)-tetrahydrofolic acid, 5,10-methylene-(6S)-tetrahydrofolic acid, 5,10-methenyl-(6S)-tetrahydrofolic acid, 5-formimino-(6R)-tetrahydrofolic acid, and polyglutamyl derivatives thereof, or, if present, one or more of said unnatural isomers of reduced folate in a molar amount less than T minus N.

69. A composition for consumption by an animal, the animal selected from the group consisting of dog, cat, poultry, cattle, goat, horse, mink, fox, and sheep, the composition comprising:

one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof; and

a nutritional substance for consumption by the animal being an essential nutrient preparation, the essential nutrient preparation comprising a vitamin other than ascorbic acid, wherein the vitamin is present in an amount equal to or greater than 25% of the daily requirement for the vitamin per customarily consumed quantity of said essential nutrient preparation.

Sub C6> 70 A composition according to claim 67 or 69, wherein the essential nutrient preparation further comprises ascorbic acid.

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Sub C67
71. A composition according to claim 67, 68 or 69, wherein the one or more natural isomers of reduced folate is selected from the group consisting of 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, and polyglutamyl derivatives thereof.

Sub A
72. A composition according to claim 67, 68 or 69, wherein each of the one or more natural isomers of reduced folate is substantially chirally pure.

Sub B61
73. A method for increasing the folate content of a nutritional substance for consumption by an animal, the animal selected from the group consisting of dog, cat, poultry, cattle, goat, horse, mink, fox, and sheep, the method comprising:

providing a nutritional substance for consumption by the animal selected from the group consisting of a food preparation, an essential nutrient preparation, and combinations thereof; and

incorporating into the nutritional substance an amount of one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof, thereby forming a composition;

wherein the total amount of said one or more natural isomers of reduced folate incorporated into said nutritional substance is between about 5% and about 3000% of an animal daily requirement for folate per customarily consumed quantity of said nutritional substance;

wherein, when the nutritional substance is a food preparation, the food preparation comprises two or more food components and each gram of said food preparation has a natural molar amount, N, of said one or more natural isomers

Sub B6
~~of reduced folate, wherein N is greater or equal to zero and wherein each gram of said composition has a total molar amount, T, of said one or more natural isomers of reduced folate greater than N; and~~

~~wherein, when the nutritional substance is an essential nutrient preparation, the essential nutrient preparation comprises a vitamin other than ascorbic acid.~~

~~74. A method for increasing the folate content of a nutritional substance for consumption by an animal, the animal selected from the group consisting of dog, cat, poultry, cattle, goat, horse, mink, fox, and sheep, the method comprising:~~

~~providing a nutritional substance for consumption by the animal being a food preparation; and~~

~~incorporating into the nutritional substance an amount of one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof, thereby forming a composition;~~

~~wherein the food preparation comprises two or more food components and each gram of said food preparation has a natural molar amount, N, of said one or more natural isomers of reduced folate, wherein N is greater or equal to zero and wherein each gram of said composition has a total molar amount, T, of said one or more natural isomers of reduced folate greater than N; and~~

~~wherein each gram of said composition further comprises no unnatural isomers of reduced folate selected from the group consisting of (6R)-tetrahydrofolic acid, 5-methyl-(6R)-tetrahydrofolic acid, 5-formyl-(6R)-tetrahydrofolic acid, 10-formyl-(6S)-tetrahydrofolic acid, 5,10-methylene-(6S)-tetrahydrofolic acid, 5,10-methenyl-(6S)-tetrahydrofolic acid,~~

5-formimino-(6R)-tetrahydrofolic acid, and polyglutamyl derivatives thereof, or, if present, one or more of said unnatural isomers of reduced folate in a molar amount less than T minus N.

75. A method for increasing the folate content of a nutritional substance for consumption by an animal, the animal selected from the group consisting of dog, cat, poultry, cattle, goat, horse, mink, fox, and sheep, the method comprising:

providing a nutritional substance for consumption by the animal being an essential nutrient preparation, the essential nutrient preparation comprising a vitamin other than ascorbic acid, wherein the vitamin is present in an amount equal to or greater than 25% of the daily requirement for the vitamin per customarily consumed quantity of said essential nutrient preparation; and

incorporating into the nutritional substance an amount of one or more natural isomers of reduced folate selected from the group consisting of (6S)-tetrahydrofolic acid, 5-methyl-(6S)-tetrahydrofolic acid, 5-formyl-(6S)-tetrahydrofolic acid, 10-formyl-(6R)-tetrahydrofolic acid, 5,10-methylene-(6R)-tetrahydrofolic acid, 5,10-methenyl-(6R)-tetrahydrofolic acid, 5-formimino-(6S)-tetrahydrofolic acid, and polyglutamyl derivatives thereof.

76. A method according to claim 73 or 75 further comprising:

incorporating into the nutritional substance an amount of one or more unnatural isomers of reduced folate selected from the group consisting of (6R)-tetrahydrofolic acid, 5-methyl-(6R)-tetrahydrofolic acid, 5-formyl-(6R)-tetrahydrofolic acid, 10-formyl-(6S)-tetrahydrofolic acid, 5,10-methylene-(6S)-tetrahydrofolic acid, 5,10-methenyl-(6S)-tetrahydrofolic acid, 5-formimino-(6R)-tetrahydrofolic acid, and polyglutamyl derivatives thereof, wherein the amount of the one or more unnatural isomers of reduced folate is less than or equal to